

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (cancelled).
2. (currently amended): An optical microscope apparatus according to claim ~~1~~18, wherein said objective lens is adapted to be focused on either one of a diffraction image plane, orthogonal to an optical axis of said illumination light, including said converging point in said optical path, and said sample.
3. (currently amended): An optical microscope apparatus comprising:
illuminating means having a single point light source;
~~and an~~ an optical converging system for emitting which focuses a single beam of illumination light ~~which converges from the illuminating means, at a converging point in a space;~~
a sample mounting table for mounting a sample between said illuminating means and said converging point ~~of said illumination light;~~
an objective lens ~~disposed~~ positioned after said converging point in an optical path, such that said illumination light is incident thereon ~~after light transmitted through or reflected by said sample is once converged at said converging point;~~ wherein the illumination light is transmitted

through the sample mounted on the sample mounting table and then converges at the converging point in said optical path; and

a spatial filter, disposed at a position of a diffraction image plane which is orthogonal to an optical axis of said illumination light, including said converging point in said optical path, ~~for which selectively blocking blocks~~ a part of said illumination light transmitted through ~~or reflected by~~ said sample,

wherein said objective lens is adapted to be focused on either one of said diffraction image plane and said sample.

4. (original): An optical microscope apparatus according to claim 3, further comprising an adjusting mechanism adapted to arbitrarily change a distance between said diffraction image plane and said sample.

5. (original): An optical microscope apparatus according to claim 4, further comprising an adjusting mechanism for substantially aligning a direction of light transmitted through said spatial filter and an optical axis of said objective lens with each other.

6. (cancelled).

7. (currently amended): An optical microscope apparatus according to claim ~~1~~18, further comprising a polarizer disposed between said illuminating means and sample mounting table,

and an analyzer disposed ~~between~~ after said sample mounting table in said optical path ~~and eyepiece~~.

8. (previously presented): An optical microscope apparatus according to claim 7, wherein said polarizer and said analyzer are rotatable about an optical axis of incident light.

9. (original): An optical microscope apparatus according to claim 7, wherein said sample mounting table is rotatable about an optical axis of incident light.

10. (original): An optical microscope apparatus according to claim 7, wherein each of said polarizer and analyzer is a linearly polarizing device.

11. (original): An optical microscope apparatus according to claim 7, wherein one of said polarizer and analyzer is a circularly polarizing device, whereas the other is a linearly polarizing device.

12. (original): An optical microscope apparatus according to claim 7, wherein each of said polarizer and analyzer is a circularly polarizing device.

13. (currently amended): An optical microscope apparatus according to claim ~~7~~26, wherein said objective lens is adapted to be focused on either one of a diffraction image plane,

orthogonal to an optical axis of said illumination light, including said converging point in said optical path, and said sample.

14. (currently amended): An optical microscope apparatus comprising:

illuminating means having a single point light source;

~~and an~~ optical converging system ~~for emitting~~ which focuses a single beam of illumination light ~~which converges from the illuminating means, at a converging point in a space;~~

a sample mounting table for mounting a sample between said illuminating means and said converging point ~~of said illumination light;~~

an objective lens ~~disposed~~ positioned after said converging point in an optical path, such that said illumination light is incident thereon; wherein the illumination light is transmitted through the sample mounted on the sample mounting table and then converges at the converging point in said optical path after light transmitted through or reflected by said sample is once converged at said converging point;

a spatial filter, disposed at a position of a diffraction image plane which is orthogonal to an optical axis of said illumination light, including said converging point in said optical path, for selectively blocking a part of said illumination light transmitted through ~~or reflected by~~ said sample; and

a polarizer disposed between said illuminating means and sample mounting table; ~~and~~

an analyzer disposed ~~between~~ after said sample mounting table in said optical path ~~and~~ eyepiece,

wherein said objective lens is adapted to be focused on either one of said diffraction image plane, and said sample.

15. (original): An optical microscope apparatus according to claim 14, further comprising an adjusting mechanism adapted to arbitrarily change a distance between said diffraction image plane and said sample.

16. (original): An optical microscope apparatus according to claim 15, further comprising an adjusting mechanism for substantially aligning a direction of light transmitted through said spatial filter and an optical axis of said objective lens with each other.

17. (original): An optical microscope apparatus according to claim 16, wherein said illumination light is monochromatic light.

18. (currently amended): An optical microscope apparatus, comprising:
illuminating means having a single point light source;
an optical converging system which focuses a single beam of illumination light from the
illuminating means, at a converging point;
a sample mounting table for mounting a sample between said illuminating means and
said converging point; and

an objective lens positioned after said converging point in an optical path, such that said illumination light is incident thereon; and~~An optical microscope apparatus according to claim 1,~~
~~further comprising~~

a phase plate, disposed on a diffraction image plane, ~~for causing direct~~which causes light incident ~~on and near said converging point or light incident on the other region thereon~~ to shift its optical phase ~~from one of being incident~~, wherein said diffraction image plane ~~being is~~ orthogonal to an optical axis of said illumination light and ~~including~~includes said converging point in said optical path;

wherein said illuminating means emits monochromatic light; the illumination light is transmitted through the sample mounted on the sample mounting table and then converges at the converging point in said optical path; and said objective lens is adapted to be focused on either one of said diffraction image plane and said sample.

19. (currently amended): An optical microscope apparatus according to claim 18, wherein said illuminating means comprises a light source for emitting white light, and a monochromating device, which converts said white light to monochromatic light, disposed behind said light source.

20. (currently amended): An optical microscope apparatus according to claim 18, wherein said phase plate causes ~~said direct-light incident thereon at~~ on and near said converging point to have a first optical phase and causes all other light incident thereon ~~light incident on the~~

~~other region~~ to have a second optical phase, wherein the first optical phase and the second optical phase are respective optical phases different from each other by about $\pi/2$.

21. (currently amended): An optical microscope apparatus according to claim 20, wherein said phase plate also has a function of attenuating an intensity of light incident on and near said converging point in said optical path.

22. (original): An optical microscope apparatus according to claim 18, wherein said objective lens is adapted to be focused on each of said diffraction image plane and said sample.

23. (currently amended): An optical microscope apparatus according to claim 22, further comprising a spatial filter, disposed nearly at a position of said diffraction image plane, for selectively blocking a part of said illumination light transmitted through ~~or reflected by~~ said sample.

24. (original): An optical microscope apparatus according to claim 23, further comprising an adjusting mechanism adapted to arbitrarily change a distance between said diffraction image plane and said sample.

25. (original): An optical microscope apparatus according to claim 24, further comprising an adjusting mechanism for substantially aligning a direction of light transmitted through said spatial filter and an optical axis of said objective lens with each other.

26. (currently amended): An optical microscope apparatus, comprising:
illuminating means having a single point light source;
an optical converging system which focuses a single beam of illumination light from the
illuminating means, at a converging point;
a sample mounting table for mounting a sample between said illuminating means and
said converging point;
an objective lens positioned after said converging point in an optical path, such that said
illumination light is incident thereon; and
~~An optical microscope apparatus according to claim 1, further comprising a linearly~~
~~polarizing device disposed near said converging point on a diffraction image plane, wherein the~~
~~diffraction image plane is orthogonal to an optical axis of said illumination light, including and~~
~~includes said converging point; and~~
~~a linear polarization analyzer, disposed between after said diffraction image plane in said~~
~~optical path and eyepiece so as to be, wherein the linear polarization analyzer is rotatable about~~
~~an optical axis of the incident light;~~
wherein the illumination light is transmitted through the sample mounted on the sample
mounting table and then converges at the converging point in said optical path; and said

objective lens is adapted to be focused on either one of said diffraction image plane and said sample.

27. (original): An optical microscope apparatus according to claim 26, wherein said objective lens is adapted to be focused on each of said diffraction image plane and said sample.

28. (currently amended): An optical microscope apparatus according to claim 27, further comprising a spatial filter, disposed nearly at a position of said diffraction image plane, for selectively blocking a part of said illumination light transmitted through ~~or reflected by~~ said sample.

29. (original): An optical microscope apparatus according to claim 28, further comprising an adjusting mechanism adapted to arbitrarily change a distance between said diffraction image plane and said sample.

30. (original): An optical microscope apparatus according to claim 29, further comprising an adjusting mechanism for substantially aligning a direction of light transmitted through said spatial filter and an optical axis of said objective lens with each other.

31. (original): An optical microscope apparatus according to claim 30, wherein said illumination light is monochromatic light.

32. (currently amended): A microscope observing method using an optical microscope apparatus comprising:

illuminating means having a single point light source ~~and;~~

an optical converging system for emitting which focuses a single beam of illumination light which converges from the illuminating means at a converging point in a space;

a sample mounting table for mounting a sample between said illuminating means and said converging point ~~of said illumination light;~~

an objective lens positioned after said converging point in an optical path, such that said illumination light is incident thereon, ~~;~~ wherein said illumination light is transmitted through ~~or reflected by~~ said sample mounted on the sample mounting table and then converges at the converging point in said optical path; and ~~wherein said illumination light converges at said converging point; and~~

a spatial filter, disposed at ~~a position of a diffraction image plane which is orthogonal to an optical axis of said illumination light, including said converging point,~~ for which selectively ~~blocking blocks~~ a part of said illumination light transmitted through ~~or reflected by~~ said sample, wherein the diffraction image plane is orthogonal to an optical axis of the illumination light and includes said converging point; and wherein said objective lens is being adapted to be focused on either one of said diffraction image plane and said sample;

said method comprising: ~~the steps of~~

focusing said objective lens onto said diffraction image plane ~~so as to observe, and~~
observing therewith a diffraction image of said sample formed on said diffraction image plane by
said illumination light ~~and;~~

adjusting said spatial filter such that only light from a desirable region of said diffraction
image is transmitted therethrough; and ~~then~~

focusing said objective lens onto said sample ~~so as to observe, and~~ observing therewith
said sample with said light transmitted through said spatial filter.

33. (currently amended): A microscope observing method using an optical microscope
apparatus comprising:

illuminating means having a single point light source;

~~for emitting an~~ an optical converging system which focuses a single beam of illumination
light ~~which converges from the illuminating means at a converging point in a space;~~

a sample mounting table for mounting a sample ~~in front of~~ between said illuminating
means and said converging point ~~of said illumination light;~~

an objective lens positioned after said converging point in said optical path such that said
illumination light is incident thereon, wherein said illumination light is transmitted through ~~or~~
~~reflected by~~ said sample mounted on the sample mounting table and then converges at the
converging point in said optical path ~~and wherein said illumination light converges at said~~
~~converging point;~~

a polarizer disposed between said illuminating means and said sample mounting table;

an analyzer disposed ~~between~~ after said sample mounting table and ~~eyepiece~~ in said
optical path; and

a spatial filter, disposed at ~~a position of~~ a diffraction image plane, ~~for which~~ selectively
~~blocking blocks~~ a part of said illumination light transmitted through ~~or reflected by~~ said sample,
wherein said diffraction image plane is being orthogonal to an optical axis of said illumination
light and includes ~~including~~ said converging point; wherein said objective lens is being adapted
to be focused on either ~~each~~ of said diffraction image plane and said sample;

said method comprising: ~~the steps of~~

focusing said objective lens onto said diffraction image plane ~~so as to observe, and~~
observing therewith a diffraction image of said sample formed on said diffraction image plane by
said illumination light and

adjusting said spatial filter such that only light from a desirable region of said diffraction
image is transmitted therethrough; and ~~then~~

focusing said objective lens onto said sample ~~so as to observe~~ and observing said sample
with said light transmitted through said spatial filter.

34. (cancelled).

35. (cancelled).

36. (currently amended): A microscope observing method using an optical microscope apparatus comprising:

illuminating means having a single point light source ~~and;~~

an optical converging system for emitting which focuses a single beam of illumination light which converges at a point in a space from the illumination means at a converging point;

a sample mounting table for mounting a sample between said illuminating means and said converging point ~~of said illumination light;~~

an objective lens positioned after said converging point in said optical path, such that said illumination light is incident thereon; ~~wherein said illumination light is transmitted through or reflected by said sample mounted on the sample mounting table and then converges at the converging point in said optical path; and wherein said illumination light converges at said converging point; and~~

a spatial filter, disposed at ~~a position of~~ a diffraction image plane, which selectively blocks a part of said illumination light transmitted through said sample, wherein the diffraction image plane is orthogonal to an optical axis of the illumination light and includes said converging point; and therein said objective lens is adapted ~~which is orthogonal to an optical axis of said illumination light, including said converging point, for selectively blocking a part of said illumination light transmitted through or reflected by said sample; said objective lens being adapted to be focused on either one of said diffraction image plane and said sample;~~

said method comprising ~~the steps of:~~

emitting ~~an~~ a single beam of illumination light from the illuminating means and which
~~converges focusing the illumination light at said converging a point in a space;~~

mounting a sample on the sample mounting table between said illuminating means and in
~~front of said converging point of said illumination light such that said illumination light is~~
~~transmitted through or reflected by said sample;~~

converging said illumination light at said converging point;

selectively blocking a part of said illumination light transmitted through ~~or reflected by~~
said sample; and

changing the position of the converging point to be in or out of said optical path of the
illumination light in the direction of the optical axis of said objective lens to adjust the size of the
diffraction image.

37. (currently amended): A microscope observing method using an optical microscope
apparatus comprising:

illuminating means having a single point light source;

~~for emitting an illumination light which converges at a point in a space~~ an optical
converging system which focuses a single beam of illumination light from the illuminating
means at a converging point;

a sample mounting table for mounting a sample ~~in front of~~ between said illuminating
means and said converging point of said illumination light;

an objective lens positioned after said converging point in an optical path, such that said illumination light is incident thereon;₁ wherein said illumination light is transmitted through ~~or reflected by~~ said sample mounted on the sample mounting table and then converges at the converging point in said optical path; ~~and~~

~~wherein said illumination light converges at said converging point~~; a polarizer disposed between said illuminating means and sample mounting table;

an analyzer disposed ~~between~~ after said sample mounting table in said optical path ~~and eyepiece~~; and

a spatial filter, disposed at ~~a position of~~ a diffraction image plane, ~~for which~~ selectively ~~blocking blocks~~ a part of said illumination light transmitted through ~~or reflected by~~ said sample, wherein said diffraction image plane ~~is being~~ orthogonal to an optical axis of said illumination light and includes including said converging point; and wherein said objective lens ~~is being~~ adapted to be focused on either ~~each~~ of said diffraction image plane and said sample;

said method comprising ~~the steps of~~:

emitting and polarizing ~~an a~~ a single beam of illumination light from the illuminating means, and focusing the single beam which converges at said converging a point in a space;₁

mounting a sample on the sample mounting table between said illuminating means and in front of said converging point ~~of said illumination light such that said illumination light is transmitted through or reflected by said sample~~;₁

converging said illumination light at said converging point;₂

selectively blocking a part of said illumination light transmitted through ~~or reflected by~~
said sample; and

changing the position of the converging point to be in or out of said optical path of the
illumination light in the direction of optical axis of said objective lens to adjust the size of the
diffraction image.

38. (cancelled).

39. (cancelled).